S-DIAS Stepper Motor Output Stage

ST 152

with 1 stepper motor output stage with Closed Loop control

- 1 brake chopper
- 1 incremental encoder input RS485/TTL
- 2 enable inputs with STO function
- 2 latch/digital inputs

The stepper motor output stage can be connected to 2-phase-stepper motors with up to 5 A phase current can be connected. The module supports an open loop mode (without incremental encoder) and a closed loop mode (with incremental encoder). An incremental encoder input is available for position feedback which supports both RS422 and TTL encoders. as well as TTL encoders. 2 Enable inputs are used to implement the STO safety functionality.

Stepper Motor Output Specifications

Number of phases	2
Output voltage	+18-55 V
Current controller frequency	maximum 32 kHz
Output current	maximum 5 A RMS
Output current over the environmental temperature	maximum 5 A continuous current at 45 °C maximum 3 A continuous current at 55 °C
DC-link capacitance	4.7 µF
Operating modes	open loop mode (without incremental encoder feedback) closed loop mode (with incremental encoder feedback)
Step resolution	full step, half step 4-/8-/16-/32-/64-/128-/256-fold
Voltage measurement	+15-65 V with an under voltage < 15 V or over voltage > 60 V, the motor output is shut down through the hardware.
Temperature measurement	0-125 °C with temperature warning at 103 °C with temperature warning at 108 °C

Brake Chopper Specifications

Number	1
Output	GND switching
Maximum current	6 A
Short-circuit protection	yes
Regen resistor	external power resistor
Regen resistor switching threshold on/off	+60 V/55 V

Incremental Encoder Input Specifications

Number	1
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (150 Ω termination, integrated in the module)
	Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module)
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal analysis	4x
Counter resolution	16 bits
Encoder power supply	+5 V/0.2 A short-circuit proof

STO Enable Input Specifications

Number	2	
Input voltage	+24 V DC	
Input voltage range	minimum +18 V	maximum +30 V
Signal level	low: ≤ +5 V	high: ≥ +15 V
Switch hysteresis	typically +11 V	
Input current	3 mA at +24 V	
Input delay	typically 0.5 ms	
Safety Level	complies with the requirements of Category 4, Performance Level "e" according to EN ISO 13849-1 and SIL3 according to IEC 62061 or EN IEC 61508.	
Safety function	STO according to EN61800-5-2, section 4.2.2.2 The motor is not supplied with energy, which can cause a turn. The stepper motor output stage does not supply energy to the motor, which can generate torque.	

Latch/Digital Input Specifications

	Number	2	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switch hysteresis	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	typically 10 µs	

Electrical Requirements

	Motor supply	+18-55 V DC	
	Current consumption of the motor supply	maximum 6 A (load-dependent)	
	Current consumption of the +24 V supply on the S-DIAS bus	typically 95 mA (incl. +5 V supply of the incremental encoder)	maximum 135 mA (incl. +5 V supply of the incremental encoder)
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus	-	-

Article Number and Miscellaneous

	Article number	20-014-152
	Standard	designed according to UL
	Approvals	CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz
	Shock resistance	EN 60529/NEMA 250	15 g
	Protection type	EN 60529/NEMA 250	IP20/Type1

Notes